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THE COLD SPRING HARBOR BIOLOGICAL LABORATORY.

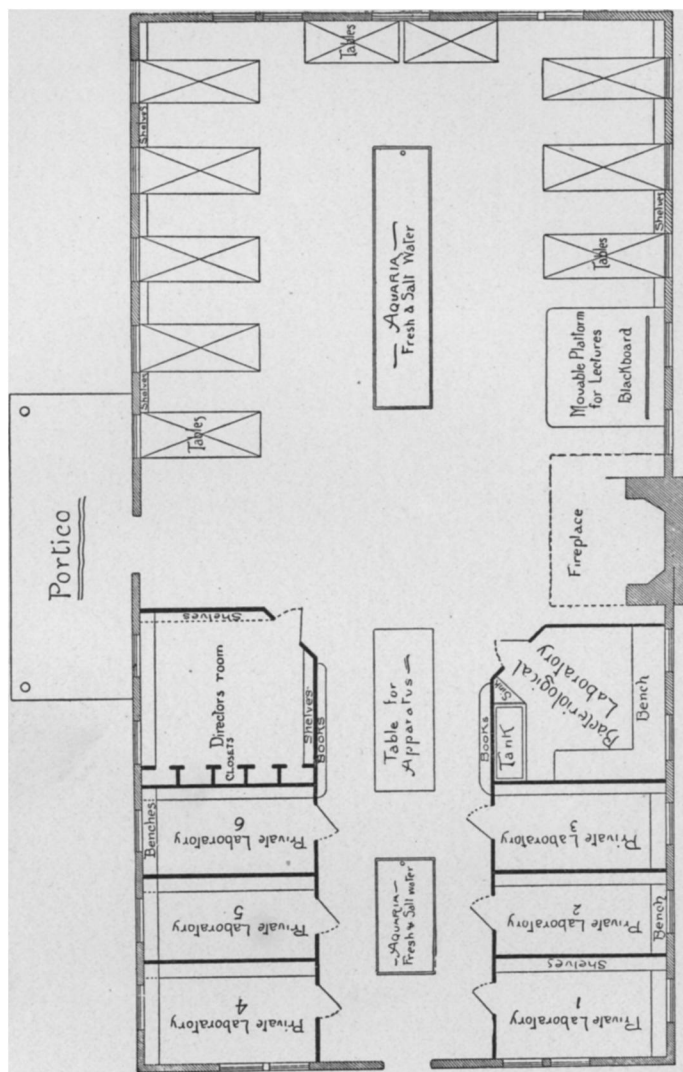
By H. W. CONN.

As elsewhere stated in these pages the American Association for the Advancement of Science at its recent meeting appropriated a sum of money to pay for an investigator's table at the Biological Laboratory at Cold Spring Harbor. This laboratory is little known to most readers of the *AMERICAN NATURALIST* and a brief account of its history and purposes are, therefore, here given.

The last fifteen years has seen established upon our coast a number of stations designed for the purpose of studying marine biology. The various stations have been quite different in their aims and in their character. Some of them have been purely private institutions where a few students are invited to the sea shore to make use of a private laboratory. In other cases certain universities have established marine laboratories designed primarily for their own students, although receiving students from elsewhere, should they choose to attend. In some cases the laboratories thus organized have been public institutions, and designed from the outset to attract all classes of students interested in biology, and to furnish to students and teachers in general a place where they may come for the purpose of pursuing summer work at the sea shore. Some of them have been planned wholly or almost wholly, for advanced work of investigation, others entirely for elementary work of instruction. Of the various laboratories above designated as public institutions only two have continued to exist for any length of time. One of these, well known to every biologist in the country, is the excellent school, stationed at Woods Holl, Massachusetts. The second one, not so well known, but rapidly coming into notice, is located at Cold Spring Harbor, Long Island.

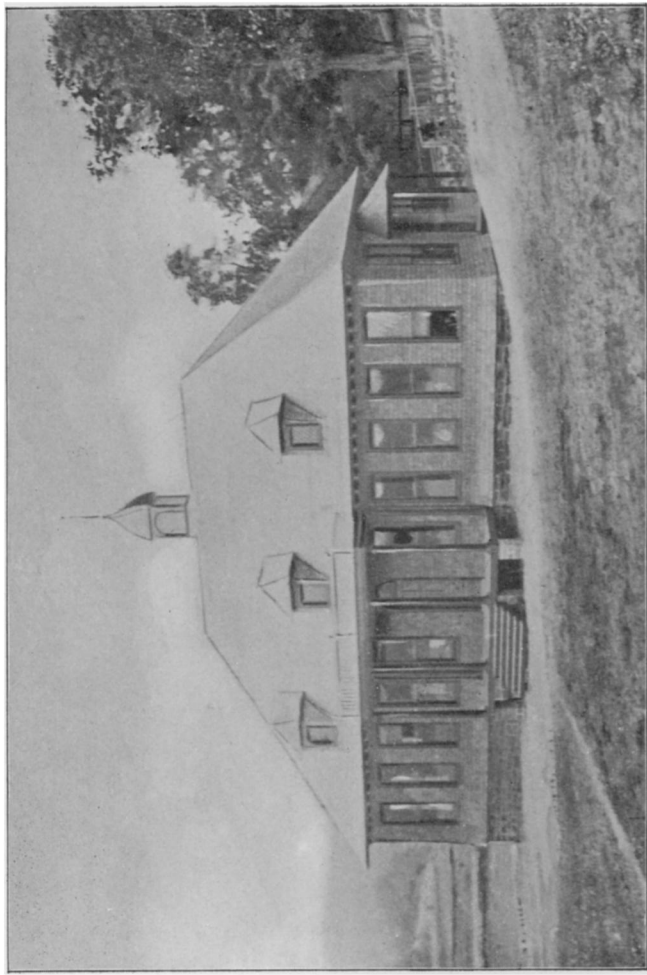
The laboratory at Cold Spring Harbor is, in some respects, especially favorably located. At a distance of an hour's ride

PLATE XII.



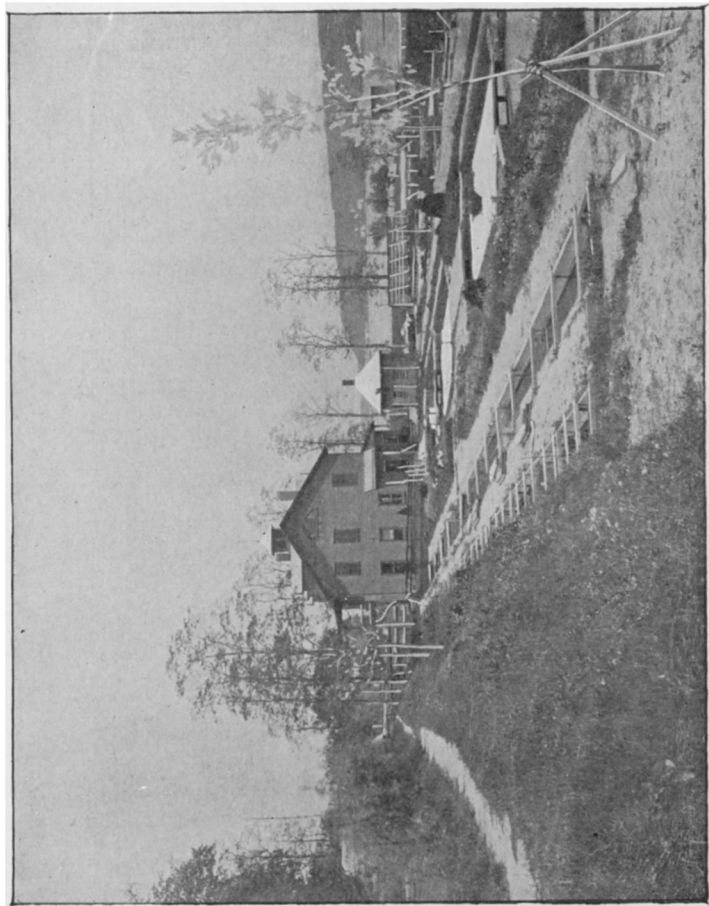
Ground plan of the Laboratory.

PLATE XIII.



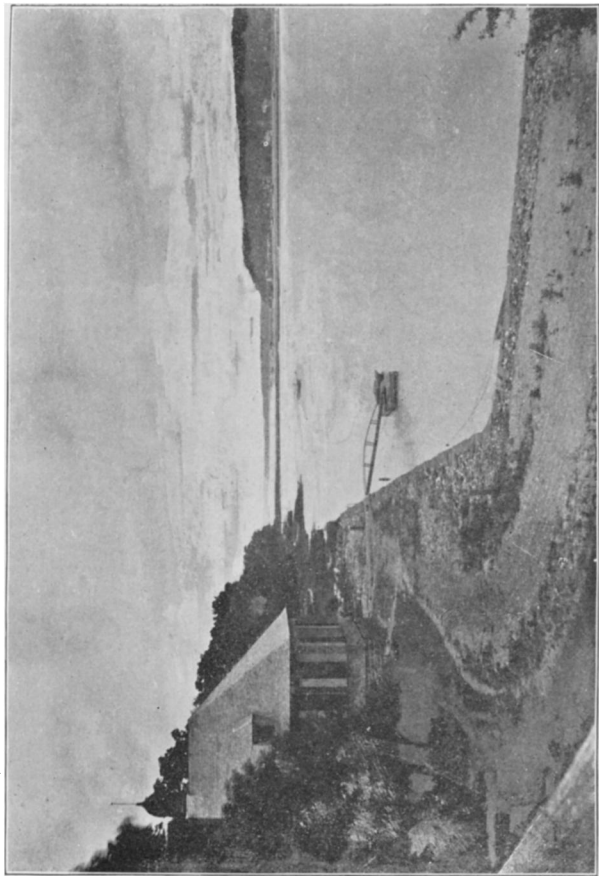
Laboratory building.

PLATE XIV.



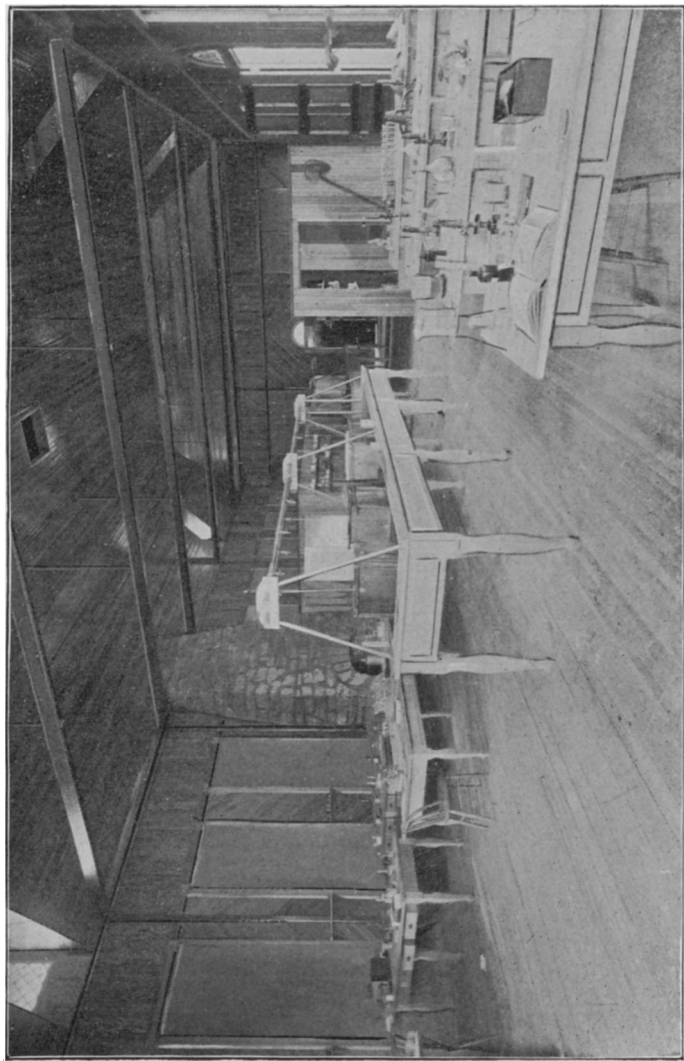
New York Fish Commission Hatchery and out door aquaria.

PLATE XV.



Cold Spring Harbor Bay, showing the Laboratory and Floating dock.

PLATE XVI.



Interior view of Laboratory.

from New York, the great centre of travel, it is most easy of access to students in any of the eastern states. It is situated on the north shore of Long Island at the head of one of its most beautiful bays. A more charming location for a marine laboratory could hardly be chosen. At this place Long Island is somewhat hilly and wooded, in marked contrast to the general flatness which characterizes the greater part of its surface. Here the wooded hills are close to the shore and the forests extend almost to the very water's edge, giving the unusual appearance of a wooded sea shore. The beauty of the place is enhanced by the presence of numerous fresh water springs which have given rise to the name of Cold Spring Harbor, and which pour an undiminished current of the clearest, coldest fresh water into the bay at all seasons of the year, unaffected in amount or in temperature, winter and summer alike. Three beautiful ponds produced by these springs give a fresh water fauna and flora which, added to the marine life of the bay, make the location of the Cold Spring Harbor in some respects unique and especially favorable for biological work.

The biological laboratory at Cold Spring Harbor was organized as a branch of Brooklyn Institute of Arts and Sciences. The excellent work of this institution of public instruction is widely known in educational circles. In the year 1889 Professor F. W. Hooper, its secretary, conceived the desirability of establishing as a branch department of the work of the Institute, a summer school of biology. With the coöperation of the New York State Fish Commission and a number of gentlemen who became interested in the undertaking, the Brooklyn Institute organized such a summer school of Biology, which was located in the building of the New York Fish Hatchery at Cold Spring Harbor and held its first session in July and August, 1890. The school has continued at the same place until the present time, holding a session each summer, and has been constantly growing in size and in the value of the work that it carries on. The laboratory still retains its connection with, and has been partly supported by the Brooklyn Institute, although it is drawing its students from a larger and larger

range of territory. At the present time it receives its patronage from a large number of educational institutions and from many of our eastern states. The school has been supported by the Brooklyn Institute aided by the generosity of many friends who have recognized the value of the work. During the first summer the direction of the school was in the hands of Dr. Bashford Bean, now of Columbia College, but during subsequent years of its history and at the present time it is under the direction of Professor H. W. Conn of Wesleyan University. Associated in the work of carrying on instruction have been a number of professors and instructors from our colleges and schools, and each year a competent board of teachers is present to assist the director in carrying on the work of the school.

When the school was organized, it, of course, had no laboratory or equipment. Except for the generosity of the New York Fish Commissioners the school would scarcely have been possible. This board kindly offered to the Institute the use of their hatchery at Cold Spring Harbor, which is very little used during the summer. For three years this building was occupied by the school. Necessary collecting and laboratory apparatus were purchased and with these inadequate conveniences three successful sessions were held. It became evident during the third year that if the school were to succeed it would need a building of its own. The laboratory had by this time made warm friends at Cold Spring Harbor and they generously offered to erect a laboratory building for the purposes of the school. The building was erected in 1893 at an expense of \$10,000 and was occupied in completeness for the first time in 1894. The new laboratory is capable of accommodating 50 students, and being especially designed for the school, is admirably adapted to its needs. It contains a general laboratory for general students; private laboratories for investigators; a library; bacteriological laboratory; aquaria furnished with running water, both salt and fresh. In addition, the institution owns boats and collecting apparatus; has a lecture hall and a dark room for photographing, in a separate building; and has the use of a large building devoted to boarding the members of the

laboratory party. During the coming Spring a dormitory building for lodging the students is to be erected, which will add greatly to the conveniences of the students. The equipment of the laboratory in the way of microscopes, small apparatus, chemicals, etc., is excellent, and embraces everything needed to make profitable a summer at the sea shore.

While the object of marine laboratories on our coast has been varied, at the outset most of them were started almost solely for the purpose of encouraging research. In several cases they consisted at first in the collection of a small number of advanced students from special universities who came to the sea shore for the purpose of carrying on work that they could not carry on at home. These little nuclei, in some cases, have grown into large schools and in other cases have remained small collections of investigators. These early students have everywhere taken their places in our institutions of learning and, appreciating their own debt to sea shore work, they are ever encouraging others in the same line of study. As the small laboratory has grown into the school its object has somewhat changed, but in most of the marine schools, that are at present in existence on our coasts, the primal object is that of original research and investigation. In recent years more attention has been given to courses of instruction, but all of the schools, except that at Cold Spring Harbor, aim primarily at encouraging investigation.

The biological laboratory at Cold Spring Harbor was organized, however, with a somewhat different purpose. The Brooklyn Institute itself is a school of public instruction, and the biological school which it organized naturally assumed from the very outset more of the character of a school of instruction than one of research. From the first the aim of the Cold Spring Harbor school has been to furnish a place where instruction in biology of the highest character could be given. For this purpose regular courses of lectures accompanied by courses of laboratory work have been given each year, and, while inviting and encouraging research, its first aim has been instruction. The ordinary student needs guidance the first one or two years at the sea shore. To give him laboratory

facilities without systematic instruction results in much misdirected work. Without systematic courses of instruction many of those desiring the advantages of marine work will spend the summer in desultory work to little profit. To avoid this result the management of the school have planned regular courses of lectures accompanied by laboratory work of the same character as the biological courses in our colleges. The courses which are given at the present time are the following : 1. Elementary Zoology ; a course of lectures with laboratory work upon zoological types. 2. Comparative Embryology ; this consists of thirty lectures upon embryology, accompanied by practical work with illustrative embryological types. 3. Elementary Botany ; including instruction in the study of flowering plants. 4. Cryptogamic Botany ; a course of lectures with laboratory work upon the chief types of cryptogams. 5. A course in bacteriology ; including 15 lectures upon the history of bacteriology and practical work upon bacteriological methods. All regular courses last six weeks, although the laboratory is open for a longer period. The work done in these courses is of the highest character. Those engaged in instruction are from our best colleges, and the nature of the courses which they give is almost identical with the courses given in the colleges themselves. Indeed, in some respects, the work in these courses at the summer schools is considerably in advance of the work that is done in the colleges in the same departments. The student at the laboratory has several weeks of uninterrupted work upon one subject, and his thoughts are not distracted by numerous other branches of learning which he is pursuing at the same time. This makes it possible for the instruction to be even more thorough and of a higher character than is possible in our colleges. The work in biology done in the school at Cold Spring Harbor is, therefore, of exactly the same character and in some respects more thorough than the biological work in the colleges. Of course not so many branches are taught as may be found in our colleges, but the branches that are taught, which are those especially requiring living specimens at the sea shore for study, are pursued with thoroughness.

The laboratory proposes further to increase its usefulness by furnishing material for class work to our schools. Marine specimens for school purposes have been difficult and expensive to obtain. The Cold Spring Laboratory, therefore, will furnish common types of marine animals at low prices to such schools as need them for work with classes.

For these reasons the school at Cold Spring Harbor offers itself as an especially favorable place for certain classes of students. Students in our colleges who wish to complete the biological work of the inland schools by practical study with animals at the sea shore will find the systematic courses here given of great use to them. Public school teachers who need a practical knowledge of animals and plants to enable them to teach the subjects of zoology and botany in an interesting manner to their students; advanced college students who have taken elementary work and desire a practical knowledge of comparative embryology or advanced zoology; medical students whose regular work in the medical school is so crowded as to leave them little time for general reading; all of these will find the training to be obtained at the summer schools, in general biology, of the utmost value. College professors, too, who desire to make collections for their classes and to obtain material for their own original work will find a place here. All of these classes of students are among the attendants of the school at Cold Spring Harbor and all find much of interest and value in the work at the school.

While, at the beginning, the object of the school at Cold Spring Harbor was to furnish a place of instruction, the more advanced side of biological work has been by no means neglected. The laboratory now in use contains private rooms for investigators. The instructors in the school and the college professors who have been present with the school in past years have been carrying on investigations of original character. Every facility is afforded to those advanced workers who desire to carry on research, and it is the aim of the management of the school to increase rather than to diminish the facilities for investigation, and thus to attract a large number of students engaged in research. During the last summer the

school at Cold Spring Harbor received its first public scientific recognition by the American Association for the Advancement of Science. This Association, on one of the excursions taken by it during its session at Brooklyn the past summer, went to Cold Spring Harbor, and a large party interested in biological work visited the laboratory. The appreciation of the Association for the character of the work done was shown by an appropriation to the school for aiding in original investigations. This money is to be used to pay for the rental of two private rooms to be known as American Association tables, and, as announced elsewhere in this magazine, these tables are open for application to all students of American biology.

The school of Cold Spring Harbor has a field for itself. The growing importance of biological work in our schools is creating yearly an increasing demand for facilities for summer work. The modern teacher is fast learning that he cannot hold his own in zoological or botanical lines without opportunities of practical work with living animals and plants; and these opportunities can be had only at the sea shore itself. There is, therefore, a growing number of teachers who are desirous of spending their summers in adding to their equipment for such work. A growing number of students are recognizing, that, in order to take their stand in the front ranks in our educational communities, a summer or two or more at a marine laboratory is becoming as inevitable a necessity as a college education itself. This growing demand is not to be met by one or two schools, but will necessitate in the future the establishment of many institutions of public instruction. The school at Cold Spring Harbor, by placing emphasis upon this matter of public instruction to teachers and students, has obtained a place for itself. Its continued success and its constant growth during its history prophecies well for its future and promises that it will remain as one of the permanent institutions of public education in America.